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Examiners' Report/ Principal Examiner Feedback

Summer 2013

International GCSE Biology (4BI0) Paper 2BR

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4BI0 2BR report

For Q1 the questions on the printed passage were about Japanese knotweed an invasive species. In (a) students needed to explain what is meant by an invasive species. Most gained some credit with the better responses explaining that a foreign species enters a new environment and competes and takes over from native species. In part (b) most students could correctly calculate the percentage of invasive species that were plants using he data in the passage. In part (c) most students could give a reason why Japanese knotweed spread so successfully. In part (d) the better students could suggest that the growth of knotweed reduces the growth of other plants by blocking out sunlight thus preventing photosynthesis or competing for nutrients and water. In part (e) some students were able to give a sensible example of biological control such as using ladybirds to control aphid populations. Some interesting local examples were chosen but centres need to give students detailed specific examples not just birds eat insects. In part (f)(I) about half of the responses could identify phloem as the tissue that contains sap. In part (f)(ii) only the better students could suggest why growth is reduced when insects feed on plant sap such as depletion of sucrose preventing respiration or depletion of amino acids reducing protein (synthesis). Finally in part (g) most students could explain why the control insect should only feed on Japanese knotweed.

Q2 required students to use information from a label on a slimming drink. In part (a) most students gained some credit with the best answers describing a balanced diet as containing the correct proportions of carbohydrate, protein, lipid, vitamins and minerals. In part (b) most could identify why the drink would not be suitable for a pregnant woman.

Q3 provided students with a diagram showing an experiment to investigate germination and energy release in seeds. In part (a) (i) almost all students correctly read the temperatures from the thermometer scales. In part (ii) about half of the responses could explain the results from the two flasks despite the fact that this experiment is referred to in the specification. In part (b) most could explain that washing the seeds in disinfectant prevents the growth of bacteria. However, in part (c) very few students could suggest why cotton wool is used rather than a rubber bung. Only the best students could suggest that it allows oxygen in and carbon dioxide to escape from the flask. In part (d) most response correctly gave a variable that should be controlled.

In Q4 students were given a graph to show how the time taken for blood to clot changes with temperature. Part (a) required them to use the graph to find the optimum temperature. Almost all students were able to do this. However in part (b) only the better responses explained why the clotting is slower at 20^{o}C than 30^{o}C. We expected reference to less kinetic energy at 20 and therefore fewer collisions. Students did slightly better at (c) explaining why blood clots more slowly at 45^{o}C. For part (d) students had the opportunity to write in prose about what happens in heart muscle cells when the coronary artery is blocked.

Most gained some credit with the best students describing that less oxygen and glucose would be available for cells to respire aerobically leading to anaerobic respiration and a build-up lactic acid thus reducing the pH and inhibiting enzyme action.

Q5 gave a diagram about the nitrogen cycle and in part (a) students had to identify the correct stages. Many scored 3 or 4 marks out of 4. In part (b) students had to explain how nitrates are absorbed into plants. The best responses described how ions are absorbed into the root hair cells by active transport against a concentration gradient using energy from respiration.

Q6 gave details of the reflex arc involved with pupil reflex. In part (a) students had to match parts of the reflex arc to the correct description. Most students were able to name the retina and the synapse but less identified the sensory neurone and the iris. In part (b) most students scored 3 or 4 marks for describing how the lens changes when viewing a near object.

Q7 gave a description of an experiment (described in the specification) to investigate the effect of light on net gas exchange from a leaf, using hydrogen-carbonate indicator. In part (a) the majority of students gained full marks for explaining that in light a leaf will carry out photosynthesis and therefore absorb carbon dioxide. Also in (b) most could explain that tube B acted as a control to show that it is the leaf that is causing the colour change in the indicator solution. In (c) most students appreciated that in dim light photosynthesis and respiration would both occur and there would be no change in the carbon dioxide concentration in the tube. In part (d) students were asked about another experiment to investigate the effect of light intensity on photosynthesis in a water plant. Most could describe how she could change her independent variable and how she could measure her dependent variable and ensure that her results were reliable.

Finally Q8 described the inheritance of A B O blood groups in humans. In part (a) about half of the responses correctly explained the meaning of codominance. Students did better in part (b) with most being able to identify the genotypes of the parents and gametes that would lead to 4 different blood groups in one family.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
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